

## REMARKS

The present amendment is submitted in response to the Office Action dated April 23, 2003, which set a three-month period for response, making this amendment due by July 23, 2003.

Claims 1-8 are pending in this application.

In the Office Action, claims 1-9 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Claims 1 and 5 were rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,672,291 to Rosenberg. Claims 2-4 and 6-8 were rejected under 35 U.S.C. 103(a) as being unpatentable over Rosenberg in view of U.S. Patent No. 5,231,344 to Marumoto et al.

In this amendment, the specification has been amended to add appropriate headings.

Regarding the rejection of the claims under Section 112, second paragraph, claims 1 and 3-8 have been amended to delete or amend the objected-to terms and phrases and to rewrite the claims to define the invention more clearly. With regard to the objection to "the torque line (29)" and "the electrical machine" having insufficient antecedent basis in a number of the claims, claim 1 defines these terms initially.

To more clearly define the present invention over the cited references, claim 1 has been amended to add the features of claim 2, which was canceled, and to more specifically define the configuration of the pulse-width modulation inverter. The Applicants respectfully submit that amended claim 1 defines a

patentably distinct set of features neither shown nor suggested by the cited references, whether viewed alone or in the cited combination.

The primary reference to Rosenberg describes a variable-speed electrical machine. The excitation of the electrical machine is coordinated to the respective RPM in such a fashion, that a desired characteristic of induced voltage or delivered output is produced. For that purpose, at least one portion of the windings generating or controlling the working flux of the machine or a resistance wired-in series before the machine is connected to a rectifier circuit, which is supplied through a frequency dependent impedance network with an a.c. voltage of a frequency proportional to the machine RPM.

Marumoto et al relates to a control apparatus for an electric generator. A chopper is provided for controlling the field current of the field winding and a pulse width modulator is provided for controlling the duty cycle of the chopper in response to the operating conditions of the engine.

Figure 9 of Rosenberg shows two excitation windings 37, 37a, which are two, different and separated excitation windings 37, 37a. However, the Applicants respectfully disagree with the Examiner's conclusion that from the embodiment of Fig. 9, it can be derived from Rosenberg that the stator winding 39 comprises a small number of coils.

In contrast, according to the present invention, one electrical machine having a winding with a first number of windings is compared with another electrical machine, having a second number of windings, as compared to the first

electrical machine. Both electrical machines, which are compared to one another, having one winding only.

The converter configuration shown in Rosenberg's Fig. 3 shows a configuration embodied as an arrangement of one-way diodes. In contrast, the arrangement 6 of the present invention shows a semi-conductor element 8, each of which is operated in parallel to a one-way diode 7, to allow the pulse width modulation inverter configuration of the present invention to operate in a broad operation range extending from the idle mode of the engine until a normal operation RPM of the engine, and consequently the electrical machine 4, is reached.

Rosenberg fails to disclose the semi-conductor elements (MOSFET's) according to the present invention. However, these components are necessary for allowing an operation range of the pulse-width modulation inverter configuration 6 used for the method of the present invention. Again, the Rosenberg reference fails to show any semi-conductor elements, but shows only passive, one-way diodes 7, which allow a current to pass in one way but prevent the current from passing in the other way.

As shown in Marumoto in Fig. 27 and disclosed in column 17, lines 8-64, the field winding chopper circuit 71 is fed by the output register 288 of the micro-computer. Field current is controlled for modification in response to the engine manifold intake pressure when a load suddenly acts on the engine. Even when the throttle is fully open, the power generation control is activated to allow the engine output to be used for acceleration performance exclusively. A knocking

condition of the engine is taken into account since in this operation condition, the driving torque required for the generator is decreased.

These examples provided in column 17 of Marumoto are related to a high RPM range of a vehicle's engine, in which the engine's power is exclusively used for vehicle transmission or acceleration performance, respectively. Similar to the Rosenberg reference, Marumoto et al discloses one-way diodes, which constitute a passively operated diode-rectifier.

In contrast, the present invention is a variable speed electrical machine, operated with a pulse-width modulation inverter, which, due to its configuration having semi-conductor components 8 arranged in parallel to one-way diodes, is capable of being operated over the entire range of operation of a vehicle's engine. In addition, the configuration of the pulse-width modulation inverter allows for compensation of voltage-differences between a vehicle's voltage supply 10 and the connecting points 5 of the electrical machine.

As noted above, claim 1 has been amended to specifically define the configuration of the pulse-width modulation inverter having semi-conductor components arranged in parallel to one-way diodes, thereby enabling operation of the engine over an entire range of operation.

For the reason set forth above, the Applicants respectfully submit that amended claim 1, along with dependent claims 3-8, is patentable over the art of record. The Applicants therefore request withdrawal of the rejections under 35 U.S.C. 102 and 103 and reconsideration of the claims as herein amended.

The Examiner has noted that the Applicant has not filed a certified copy of the priority document as required by 35 U.S.C. 119(b).

However, this application is an Entry into the National Phase of a PCT Application. Accordingly, Applicant is not required to file a certified copy of the priority document, since this document is sent directly from WIPO to the USPTO, and therefore should be in the file of the subject application.

In light of the foregoing arguments in support of patentability, the Applicants respectfully submit that this application stands in condition for allowance. Action to this end is courteously solicited.

Should the Examiner have any further comments or suggestions, the undersigned would very much welcome a telephone call in order to discuss appropriate claim language that will place the application into condition for allowance.

Respectfully submitted,



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